



IDAHO DEPARTMENT  
OF ENVIRONMENTAL  
QUALITY

# **EXPLANATION OF SIGNIFICANT DIFFERENCE**

## **For Argonne National Laboratory - West**



Operable Unit 9-04  
Idaho National Engineering and Environmental Laboratory  
Idaho Falls, Idaho


**Explanation of Significant Difference for the  
Record of Decision for Argonne National Laboratory-West  
Operable Unit 9-04**

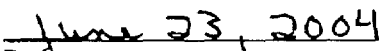
**May 2004**

**Prepared by the  
U.S. Department of Energy  
Chicago Operations Office**

## Signature Sheet

Signature sheet for the *Explanation of Significant Difference to the Record of Decision for Argonne National Laboratory-West Operable Unit 9-04* at the Idaho National Engineering and Environmental Laboratory, between the U.S. Department of Energy and the U.S. Environmental Protection Agency, with concurrence by the Idaho Department of Environmental Quality.

  
Kathryn M. Davidson, Acting Director  
Office of Environmental Cleanup  
U.S. Environmental Protection Agency

  
Date

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Jon Sandoval  
Chief of Staff

C. Stephen Allred,  
Director  
Idaho Department of Environmental Quality

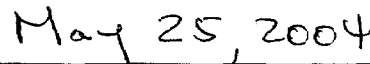
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Robert C. Wunderlich, Site Manager  
Argonne Site Office  
U.S. Department of Energy



Date

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## ACRONYMS

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ANL-E	Argonne National Laboratory - East
ANL-W	Argonne National Laboratory - West
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
ESD	Explanation of Significant Differences
DOE	Department of Energy
DOE-CH	Department of Energy Chicago Operations Office
EPA	Environmental Protection Agency
FFA/CO	Federal Facility Agreement and Consent Order
ICDF	INEEL CERCLA Disposal Facility
IDEQ	Idaho Department of Environmental Quality
INEEL	Idaho National Engineering and Environmental Laboratory
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ROD	Record of Decision
RG	Remediation Goals
RWMC	Radioactive Waste Management Complex
SARA	Superfund Amendments and Reauthorization Act

# **Explanation of Significant Differences for the Record of Decision for OU 9-04 at the Argonne National Laboratory-West**

## **1. INTRODUCTION**

This document presents an Explanation of Significant Difference (ESD) from the Record of Decision (ROD) for the Argonne National Laboratory-West, Operable Unit 9-04, signed by the United States Department of Energy (DOE), the United States Environmental Protection Agency (EPA), and the Idaho Department of Environmental Quality (DEQ) in September of 1998. The ROD was signed pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and the December 1991 Federal Facility Agreement and Consent Order (FFA/CO) entered into by DOE, EPA, and DEQ.

Site Name and Location:

Argonne National Laboratory - West, Waste Area Group 9  
Operable Unit 9-04  
Idaho National Engineering and Environmental Laboratory  
Idaho Falls, Idaho

The lead agency for remedial action at OU 9-04 is the United States Department of Energy Chicago Operations Office (DOE-CH). The EPA and the DEQ both concur with, and agree with the need for, this significant change to the selected remedy. The three agencies participated jointly in the review of new information and in the decision making that led to the preparation of this ESD.

This ESD has been prepared in accordance with Section 117© of CERCLA and 40 CFR 300.435 (c)(2)(I) to explain the needed modifications to the selected remedy identified in the ROD. In summary, this ESD implements the contingent remedy of Excavation and Disposal for three sites at ANL-W. These three sites are the Industrial Waste Pond, Ditch A, and the Industrial Waste Lift Station Discharge Ditch. Each of these sites contain levels of contaminants that exceed the established Remediation Goals. These contaminated soils will be excavated and disposed of using appropriate landfills at the Idaho National Engineering and Environmental Laboratory (INEEL). No changes to the final Remediation Goals are being made. This change does not increase risk to ecological or human receptors and the ROD remains protective and continues to meet the applicable or relevant and appropriate requirements. The DEQ and the EPA support the need for this ESD.

This ESD and other relevant documents will become part of the Administrative Record pursuant to Section 300.825 (a)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Copies of this ESD and the Administrative Record are available to the public in the following regional INEEL information repositories:



INEEL Technical Library  
DOE Public Reading Room  
1176 Science Center Drive  
Idaho Falls, Idaho 83415  
(208) 526-1185

University of Idaho Library  
University of Idaho Campus  
Moscow, Idaho 83843  
(208) 885-6344

Albertson's Library  
Boise State University  
1910 University Drive  
Boise, Idaho 83725  
(208) 385-1621

## 2. SITE HISTORY, CONTAMINATION PROBLEMS, AND SELECTED REMEDY

The INEEL is a 2,305 km<sup>2</sup> (890 mi<sup>2</sup>) Federal facility operated by the DOE and is located on the northern edge of the Eastern Snake River Plain. The Argonne National Laboratory - West (ANL-W) complex is located approximately 48 km (30 mi) west of Idaho Falls in the eastern portion of the INEEL and extends over an area of approximately 3.3 km<sup>2</sup> (810 acres). Figure 1 shows the location of the INEEL and the ANL-W site. The OU 9-04 ROD, which was signed in September 1998, identified surface soils as the only media of concern. The OU 9-04 ROD identified Alternative 5, Phytoremediation, as the selected remedy to remediate all of the sites pending successful bench-scale testing. The OU 9-04 ROD also identified a contingent remedy known as Alternative 4, Excavation and on-INEEL disposal of contaminated soils at either the proposed Soils Repository or the Radioactive Waste Management Complex (RWMC). This contingent remedy was to be implemented if the selected remedy could not be adequately performed.

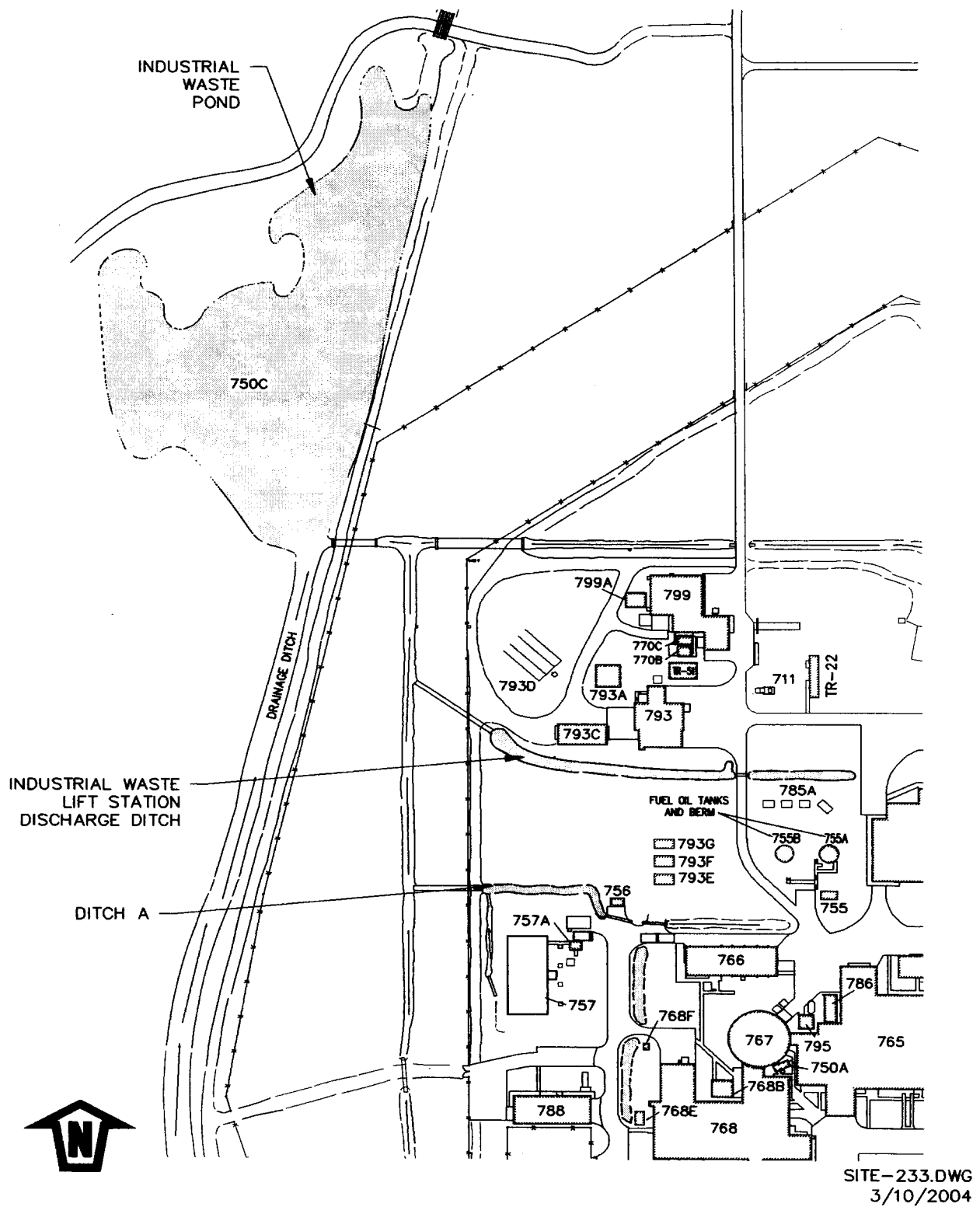
The principal source of contamination at ANL-W is located in the ditches that transport both surface water runoff and industrial wastewater discharges on the ANL-W site. The industrial wastewater discharges contained minor concentrations of contaminants. These contaminants filtered into the fine soils of the ditch and pond bottoms over the last 40 years of operation. The maximum depths of the contaminants at each site vary slightly but generally are contained within the top two feet of the soils. The contaminants include five inorganics (chromium, mercury, selenium, silver, and zinc) and one radionuclide (cesium-137). The contaminants found at these sites do not contain listed hazardous wastes nor do they contain characteristic hazardous wastes under the Resource Conservation and Recovery Act (RCRA). All of the ANL-W inactive waste sites requiring remedial action are shown in Figure 2.

The change of remedy described in this ESD concerns the remedy for the Industrial Waste Pond (ANL-01), and portions of Ditch A (ANL-01), and the Industrial Waste Lift Station Discharge Ditch (ANL-35) [see Figure 2]. The Industrial Waste Pond contains cesium-137 at levels that pose unacceptable risks to humans (8E-04 for 0-25 year Occupational scenario). The Industrial Waste Pond also contains elevated concentrations of mercury, trivalent chromium, selenium, and zinc which pose unacceptable risks to the ecological receptors (numerous plant species and the Merriam's shrew). Ditch A contains mercury and the Industrial Waste Lift Station Discharge Ditch contains silver, both of which pose unacceptable risks to ecological receptors in the avian (bird) and plant species, respectively.

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**Figure 2.** Location of Three Sites Affected by this ESD.

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### 3. DESCRIPTION OF SIGNIFICANT DIFFERENCES

The first change in this ESD involves the implementation of the contingent remedy for the Industrial Waste Pond. As previously stated, the Industrial Waste Pond contains cesium-137 that poses an unacceptable risk to humans and also contains four inorganics that pose unacceptable risks to the ecological receptors. In September of 1998 when the ROD was signed, it was estimated that it would take five years to remediate the Industrial Waste Pond using the selected remedy of phytoremediation. Results of greenhouse experiments on actual contaminated soils in 1999 led to a revised estimate of seven years. Experience with phytoremediation at similarly contaminated nearby sites over a period of four years has shown that the Industrial Waste Pond contaminants will be more resistant to phytoremediation than estimated. Therefore more than seven years would be required to achieve the remediation goals.

When the ROD was signed in 1998, the Industrial Waste Pond was actively receiving clean cooling waters from the treatment of sodium hazardous waste in the ANL-West Sodium Process Facility. In 1998 it was estimated that the sodium processing activities would continue until 2002/2003 and then the clean cooling water discharges to the Industrial Waste Pond would cease, allowing the pond to dry up and phytoremediation activities (tree planting) to proceed. However, a new project at Argonne National Laboratory - West has been identified that may restart the sodium processing activities and refill the Industrial Waste Pond with cooling water in the 2006-2008 time frame. The resulting accumulation of water in the pond would preclude the use of phytoremediation. Because it would take over seven years to complete phytoremediation and meet the Remediation Goals at the Industrial Waste Pond, and because the selected remedy would conflict with the potential need to reuse the pond, the selected phytoremediation remedy is no longer considered to be viable. If implemented, the contingent remedy of excavation and disposal can be completed by the end of 2004.

The second change proposed by this ESD is that DOE wants to use limited excavation and disposal to remove small localized spots of residual metal contamination remaining in Ditch A and the Industrial Waste Lift Station Discharge Ditch. To date, four years of phytoremediation have been completed for these areas. In accordance with the ROD, the phytoremediation project continued from 1999 through 2002 with samples collected of the soils and plants each year. Based on these results, it was anticipated by DOE that the ROD - established Remediation Goals for each of the four sites would be achieved after only four years of phytoremediation rather than the originally estimated five years. However, verification sample results received in 2003 indicated that phytoremediation was completely successful in only two of the four sites. A few areas in Ditch A and the Industrial Waste Lift Station Discharge Ditch were shown to have small areas that are resistant to phytoremediation and still contain elevated levels of mercury and silver. The two areas with elevated levels of contaminants contain approximately 37 cubic yards of soil each. The continuation of phytoremediation for an unknown multi-year period of time to attempt to remove the mercury and silver in these sites is now not considered viable. Consequently, the DOE wants to implement the contingent remedy of excavation and disposal for those areas in Ditch A and the Industrial Waste Lift Station Discharge Ditch that still exceed the Remediation Goals. Both proposed changes to the implementation of the ROD are intended to speed up the cleanup activities at Argonne National Laboratory-West.

The third change is simply a clarification in the disposal location of the excavated soils. Since 1998 when the ROD was signed, a number of changes have taken place at the INEEL. The biggest change is that the "Proposed Soils Repository" mentioned in the ROD has been built and is now called the INEEL CERCLA Disposal Facility (ICDF). The ICDF has been constructed and is being used for the disposal of contaminated CERCLA wastes from across the INEEL. The ICDF is located approximately 20 miles



from the ANL-W Industrial Waste Pond. The soils in the Industrial Waste Pond that contain low levels of cesium-137 and trace inorganics will be sent to the ICDF for disposal.

CERCLA Section 104(d)(4) allows that where two or more noncontiguous facilities reasonably related on the basis of geography or on the basis of a threat or potential threat to public health, welfare or the environment, the President may, in his discretion, treat these related facilities as one for purposes of this Section. The preamble to the NCP (55 Fed Reg 8690) further explains that when noncontiguous facilities (i.e., separate operable units) are reasonably close to one another and/or wastes at these sites are compatible for a selected treatment or disposal approach, CERCLA Section 104(d)(4) allows the lead agency to treat these related facilities as one site for response purposes and, therefore, allows the lead agency to manage waste transferred between such noncontiguous facilities without having to obtain a permit. The ICDF is designated in the WAG 3-13 ROD for the storage and disposal of INEEL-wide CERCLA waste, such as the contaminated soil that will be generated as a result of the ESD for OU-9-04. Therefore, the excavation areas addressed by this ESD and the ICDF are considered to be a single site for the response purposes under this ESD.

Excavated soils that do not contain radioactive materials, but contain inorganics above the remediation goals, will be disposed of at the Central Facilities Area Industrial Waste Landfill on the INEEL. The excavated soils from Ditch A and the Industrial Waste Lift Station Discharge Ditch contain low levels of mercury and silver that pose risks to ecological receptors only. Since the soils do not contain enough contamination to make them RCRA listed hazardous wastes nor are they characteristically hazardous under RCRA, these soils can be disposed of at an approved Industrial Landfill that will eventually be closed and capped. The approved Industrial Landfill that DOE has chosen to use is the INEEL Central Facilities Area Industrial Waste Landfill. This is an active Non-Municipal Solid Waste Landfill that is operated in accordance with 40 CFR 257 Subpart A.. The soils will be placed in the bottom of the landfill cells, providing at least ten feet of separation to the ecological receptors (burrowing mammals). The final capping and closure of the INEEL Central Facilities Area Industrial Waste Landfill will permanently eliminate ecological risks from the ditch soils since they would remain at a depth much greater than ten feet and have protective measures to ensure that contaminants do not have a viable pathway to reach plants or animals. DOE will test these soils to ensure that the acceptance criteria for the INEEL Central Facilities Area Industrial Waste Landfill are met prior to transport and disposal.

For those excavation areas where contaminated soil will be disposed in the CFA Landfill, EPA has determined that because the CFA Landfill is not a CERCLA facility nor located in the area of contamination associated with the excavations at ANL-W, the CFA Landfill is not considered "onsite" under 40 CFR 300.400(e)(1) for purposes of the Off-Site Disposal Rule under CERCLA Section 121(d)(3) and 40 CFR 300.440 and thus an Off-Site determination must be made.

Such a determination was made and the DOE, DEQ and EPA agree that the Central Facilities Area Industrial Waste Landfill complies with the substantive requirements of the Off-Site Disposal Rule--{40 CFR 300, 58 FR 49200}. This rule requires that the landfill be in compliance with federal, state, and local regulations governing non-RCRA landfills, and that the landfill have no current or historic releases of hazardous substances to the environment.

The estimated total cost to implement the excavation and disposal remedy at the three sites affected by this ESD is \$1,800,000. The actual costs to complete the remedy may increase if the volume of contamination is found to be greater than anticipated. The cost to implement the contingent remedy of excavation and disposal is not significantly lower than the cost to implement the selected remedy. The cost estimate summaries for the remediation of each ANL-W inactive waste site and all alternative

remedies can be found in the Waste Area Group 9 Remedial Investigation/Feasibility Study, Appendix M, page M-5.

In summary, the specific reasons for this ESD are:

1. DOE wants to implement the contingent remedy of Excavation and Disposal (Alternative 4) for the soils in the Industrial Waste Pond rather than using the selected remedy of phytoremediation. This change allows the cleanup of the Industrial Waste Pond to the established ROD Remediation Goals to occur in one year instead of the originally estimated five years. The change also prevents a potential impact on the cleanup process caused by significant clean cooling water discharges entering the pond in the 2006-2008 time frame.
2. DOE wants to complete the cleanup of localized spots of metal contamination remaining after phytoremediation in Ditch A and the Industrial Waste Lift Station Discharge Ditch using the ROD contingent remedy of Excavation and Disposal.
3. Consistent with the ROD, the soils removed from excavation and disposal processes will be placed in an appropriate INEEL facility. The INEEL disposal facilities are now defined and are as follows: The nonradioactive soils (Ditch A and Industrial Waste Lift Station Discharge Ditch) that exceed the Remediation Goals will be transported and disposed at the Central Facilities Area Industrial Waste Landfill if the soils meet the waste acceptance criteria. The radioactive soils (from the Industrial Waste Pond) that exceed the Remediation Goals will be transported and disposed of at the INEEL CERCLA Disposal Facility (ICDF) in accordance with the ICDF waste acceptance criteria.

## **4. AGENCY COMMENTS**

The DEQ and the EPA have reviewed this ESD and support these changes to the selected remedy. The EPA, DOE and DEQ believe that the contingent remedy remains protective of human health and the environment, complies with federal and state requirements that were identified in the ROD as applicable or relevant and appropriate to this remedial action at the time the original ROD was signed, and is cost-effective. In addition, the revised remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

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## **5. PUBLIC PARTICIPATION ACTIVITIES**

The INEEL will publish a notice of availability and brief description of this ESD in the local newspaper (the Idaho Falls *Post Register*) and six other Idaho newspapers. The INEEL Community Relations Office may be contacted at (208) 526-4700 or (800) 708-2680. This meets the requirements in 40 CFR 300.4359(c)(2)(I), "Community Relations."

The public is encouraged to review this ESD and other relevant documentation in the Administrative Record and provide comments to any of the Agencies involved. Additional information may be requested within 14 days of the notice of issuance for this ESD by contacting:

Erik Simpson  
INEEL Community Relations Plan Office  
P.O. Box 2047  
Idaho Falls, Idaho 83403-2047  
(208) 526-4700

## **6. AFFIRMATION OF THE STATUTORY DETERMINATIONS**

After reviewing the proposed changes to the selected remedies, DOE-CH, EPA and DEQ believe the remedies remain protective of human health and the environment, comply with federal and state requirements in the ROD as applicable or relevant and appropriate to these remedial actions at the time of the original ROD, and are cost-effective. In addition, permanent solutions and alternative treatment technologies are included in the revised remedy to the maximum practicable extent. After implementation of the contingent remedy as described in this ESD, the Remediation Goals in the original ROD will have been met for each of the three affected sites. The implementation of the contingent remedy to excavate and dispose of contaminated soils in the Industrial Waste Pond (ANL-01), Ditch A (ANL-01), and the Industrial Waste Lift Station Discharge Ditch (ANL-35) satisfies the requirements of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA/Superfund) (42 USC 9601 et seq.).

## 7. REFERENCES

- A. *Final Record of decision for Argonne National Laboratory - West*  
Document Number: W7500-000-ES-04      Dated: September 29, 1998
- B. *Radioanalytical Data Limitations and Validation Report* by Bechtel BWXT Idaho LLC  
Report Number: ANL-F3J060185-11-03      Dated: November 18, 2003